

MASTER

TITLE: PLANNING FOR ENERGY EFFICIENCY IN ALBUQUERQUE

AUTHOR(S): Rick Mathews, VSM
Scott Noll
Virginia Parsons, VSM
Fred Roach
Economics Group
Los Alamos National Laboratory

SUBMITTED TO: AS/ISES Conference, Philadelphia, Pennsylvania
26-29 May 1981

DISCLAIMER

By acceptance of this article, the publisher recognizes that the U.S. Government retains a nonexclusive, royalty-free license to publish or reproduce the published form of this contribution or to allow others to do so, for U.S. Government purposes.

The Los Alamos Scientific Laboratory requests that the publisher identify this article as work performed under the auspices of the U.S. Department of Energy.

University of California



LOS ALAMOS SCIENTIFIC LABORATORY

Post Office Box 1663 Los Alamos, New Mexico 87545

An Affirmative Action/Equal Opportunity Employer

PLANNING FOR ENERGY EFFICIENCY IN ALBUQUERQUE

Rick Mathews
Scott Noll
Virginia Parsons
Fred Roach
Economics Group
Los Alamos National Laboratory
P.O. Box 1663
Los Alamos, New Mexico 87545

ABSTRACT

Many localities do not have the resources to initiate an energy efficiency program for the built environment. This paper recounts the experience of the Economics Group at Los Alamos in investigating low-cost/no-cost energy planning methods in the city of Albuquerque, New Mexico.

1. INTRODUCTION

The Economics Group at Los Alamos is writing an energy planning Sourcebook which will assist localities in initiating a local energy efficiency program for the built environment. The book is directed toward groups of people or communities that have limited staff or funds to commit to energy planning, and are relatively unfamiliar with the energy planning process. In addition to relaying information about successful activities in the pioneer solar cities of the U.S., we are presenting low-cost/no-cost planning options for determining conservation and passive solar potential, for financing a program, and for public outreach. The information presented in this paper deals with our experiences in the City of Albuquerque which is serving as a testing ground for our ideas.

2. ANALYZING CONSERVATION AND PASSIVE SOLAR POTENTIAL

One of the first steps in planning for energy efficiency is an analysis of the potential energy savings from a conservation and passive solar retrofit program. This enables the planner to determine the economic benefits which include in addition to energy savings, job creation and increased local income levels. In addition to being an aide in determining the lowest cost path, an analysis showing potential energy savings and job creation enables the planner to market the program to others. In Fiscal Year 1980, Steve Martin designed a methodology for estimating the economic impacts of a passive solar retrofit program for the

City of Albuquerque.[1] The study was limited to single-family residences with a retrofit greenhouse, Trombe or Morse Wall. Martin's housing sample came from the State of New Mexico's Home Energy Audit and he used Lawrence Berkeley Laboratory's Two-Zone program for analysis of heat loss/solar-gain, two fairly sophisticated, expensive and not always readily available tools.

For the purposes of the Sourcebook, we are simplifying Martin's economic analysis and investigating low cost procedures for collecting information about building stock characteristics. The characteristics of the building stock are necessary in determining existing heat loss within the community and the potential for conservation and passive solar retrofit. We are expanding the building sectors to include in addition to single-family residences, mobile homes, multi-family, and commercial strip.

2.1 Residential Data

Many cities may not have access to audit information such as the New Mexico Home Energy Audit. Hiring an audit team or waiting for residential conservation service information may not be feasible. In this case, an energy planner must pursue their own audit. This can be achieved by doing heat-loss/solar-gain analysis based on a sample of the housing stock for each neighborhood. We are in the process of sampling neighborhoods in Albuquerque in cooperation with the Albuquerque Public School System. Several classes from each school take home a simple audit form, complete it with their parents, then return it to the teacher. Two researchers visit the class three times to explain heat loss, show slides on passive solar, and distribute the questionnaires. An idea of the housing stock for that neighborhood is obtained in addition to the dual purpose of information transfer to the students and their parents. The children receive a copy of their home's performance broken down into % of heat loss from walls, floors, ceilings, etc. The only tools necessary are a copying machine to duplicate the questionnaires, a slide presentation,

and a desk top programmable calculator which speeds up the heat loss/solar gain calculations.

2.2 Commercial Data

We are using a block study approach to analyze the commercial sector. We have selected two different types of commercial strips; one with no off street parking and attached structures and one with off street parking and detached structures. The data gathering effort is a cooperative between the commercial sector, the Public Service Company of New Mexico, the Gas Company of New Mexico, the Architecture School of The University of New Mexico, and ourselves. The utilities are providing technical assistance and energy consumption data; the students are providing designs and legwork, and we are pulling the information together to provide the economic analysis. The shop owner is providing the patience to put up with all of us, and access to billing data for the building.

3. FINANCING

A comprehensive local retrofit strategy will necessarily include a financing program to spur public adoption of energy efficient technologies. Economic incentives and appropriate financing mechanisms are needed to overcome misleading market information which is provided to energy consumers through average costing of conventional energy supplies. Appropriate financing mechanisms encourage the community resident or businessman to adopt energy efficient technologies that will, in the long run, provide economic benefits to himself and the community.

The local financing program should also attempt to meet community needs that are not adequately addressed under federal or state incentives. These needs may relate to particular technology which may be appropriate to the area (passive) or the economic requirements of a particular segment of the population such as low and moderate income household or renters.

Our efforts in Albuquerque thus far have centered on identifying potential financing sources for an energy retrofit program. Awareness of the energy problem in the city is generally low and no (financial?) programs are currently operating or planned for in either the public or private sectors at this time. A recent effort at the state level to develop a solar loan program failed due to an inadequate spread between the rate at which lenders borrowed funds from the state (2%) and the rate at which they would provide loans to residents (5%). This spread was inadequate to cover lender origination

and serving fees and to cover potential costs associated with defaulted loans. The exception is the Urban Architecture Department where a dedicated individual is using community development funds to finance energy efficient housing rehabilitation on a small scale. Most of our work thus far has been focused on interviewing the public and private decisionmakers who would likely be involved in the local financing effort. These individuals include bankers, urban rehabilitation specialists, city finance directors, and officials in the state energy department. These interviews have given us a good idea of the potential legal, political, and social considerations in formulating a financing program for the city. With these considerations in mind, we are evaluating finding approaches by utilizing other cities with an eye out for identifying those approaches which may be applicable to Albuquerque. In addition we are trying to assess the particular advantages/disadvantages of various financing strategies in terms of cost/benefit, administrative efficiency and political acceptability. These considerations may be related to the Albuquerque situation and also provide useful information for planning groups in other cities.

4. OUTREACH

Many of us who work in the conservation and solar field are unaware of the general public's perception of the technologies. In many cases, the public has no idea of the difference between passive and active solar or the basics of heat-loss/solar-gain. It is the responsibility of a person wishing to initiate a local energy program to inform the public of the benefits. Without the support of the people in addition to local government, institutions and organizations, the program will not succeed.

Our activities with the City of Albuquerque, the public schools, the utilities, shop owners, and The University have produced more than inexpensive data gathering techniques. The different interest groups involved are interacting because a task which involves everyone's cooperative effort has been initiated. As we dig deeper and deeper into the information which is available, we keep turning up interested parties. Each of these people is making our effort successful.

Our initial contact with local government was with the Albuquerque Conservation Council. The Council was only mildly interested in our project. However, from this meeting we met with Michael Minturn - a person who is responsible for the City's energy program. Minturn and the Council spend most of their time on energy matters other than

buildings. Because the cost of gas is relatively low in the Southwest, the City simply is not concerned with energy savings for the built environment at this time.

One benefit from this interaction, however, was in access to contact persons and support. We have been capable of obtaining data from other local government agencies and names of key people to contact for information on many different aspects of our program.

For example, the work being done in urban rehabilitation provided us with a person with access to cost information on moderate and low income solar and conservation retrofit options. Each example is constructed with materials and designs suited for the Southwest. The work is also potential solar/conservation demonstration or tour material.

In one of our first meetings with the City, we made contact with the Public Service Company of New Mexico. We have found PNM and the other local utilities to be more than cooperative. We have gained free technical assistance and access to utility records, reports, and audits. The City also provided the name of a contact person in the public schools. The person suggested a plan of attack for gaining access to volunteer teachers. We had initially planned to start at the top (the school board) and work down to the teacher. This approach would have taken much too much time, given the climate

in Albuquerque. The person's suggestion proved to be very necessary to our success; a simple advertisement in the teacher newsletter has provided a timely "in."

We have found from our contact with the public schools and the commercial strip proprietors that there are many misconceptions about solar and conservation. By mixing groups of "experts," students and building owners together, we come up with the beginnings for an outreach program. We plan to continue with contacts in neighborhood groups, churches, and the private sector such as builders, real estate, and financial institutions. Upon completion of our study this fall we plan to have stirred up enough interest to get more conservation and solar retrofit activity going in Albuquerque.

5. ACKNOWLEDGEMENTS

The research staff involved with this project wish to acknowledge the continuing support of the Department of Energy Passive Solar Branch and the people of the City of Albuquerque.

6. REFERENCE

[1] Martin, Steve; Noll, Scott; Roach, Fred, "Economic Implications of a Passive Solar Retrofit Program in Albuquerque, New Mexico," LA-UR-80-1419, Los Alamos, New Mexico, (1980).